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What is claimed is:

1. A transfection vector comprising a synthetic polypeptide linked electrostatically to a DNA structural sequence, forming a polypeptide-DNA complex, wherein said polypeptide is comprised of (A) a polymeric chain of basic amino acid residues, (B) a nuclear localization signal (NLS) peptide and (C) a hinge region of neutral amino acids that connects said polymeric chain and said NLS peptide.
2. The vector of claim 1, wherein said polymeric chain is comprised of between 10 and 50 residues.
3. The vector of claim 1, wherein said basic amino acid residues are selected from the group consisting of lysine, arginine and ornithine.
4. The vector of claim 1, wherein said NLS peptide is selected from the group consisting of a Simian Virus 40 (SV40) large T antigen nuclear localization signal sequence, a polyoma large T antigen nuclear localization signal sequence, an adenovirus E1a nuclear localization signal sequence, and an adenovirus E1b nuclear localization signal sequence.
5. The vector of claim 1, wherein said hinge region is comprised of between 6 and 50 amino acid residues.
6. The vector of claim 1, wherein said neutral amino acids are selected from the group consisting of glycine, alanine, leucine and isoleucine.
7. The vector of claim 1, wherein said NLS peptide is located at the amino terminus of said polypeptide and said polymeric basic amino acid chain is located at the carboxyl terminus.
8. The transfection vector of claim 1, further comprising (D) a cell type-specific ligand molecule.
9. The transfection vector of claim 1, wherein said DNA structural sequence comprises (a) a segment coding for SV40 large T antigen or polyoma large T antigen and (b) a transcription factor gene.
10. A vector according to claim 1, wherein said DNA structural sequence comprises an oncogene.
11. A vector according to claim 10, wherein said oncogene is selected from the group consisting of SV40 large T antigen, polyoma large T antigen, adenovirus E1A, adenovirus E1B, v-fms, BC12, myc, and ras.
12. A vector according to claim 1, wherein said DNA structural sequence comprises a DNA sequence selected from the group consisting of a dihydrofolate reductase gene (DHFR), a thymidine kinase gene, a thymidylate synthetase gene, a DRTF1/E2F transcription factor-encoding DNA sequence, and an E2F transcription factor-encoding DNA sequence.
13. A process for producing a transformed mammalian cell line, comprising the step of transfecting a mammalian cell with a vector according to claim 1, wherein said DNA structural sequence comprises a DNA sequence selected from the group consisting of a dihydrofolate reductase gene (DHFR), a thymidine kinase gene, a thymidylate synthetase gene, a DRTF1/E2F transcription factor-encoding DNA sequence, and an E2F transcription factor-encoding DNA sequence.
14. A process for producing a transformed mammalian cell line, comprising the step of transfecting a mammalian cell with a vector according to claim 1, wherein said DNA structural sequence comprises an oncogene.

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15. A transfection vector comprising a synthetic polypeptide linked electrostatically to a DNA structural sequence, forming a polypeptide-DNA complex, wherein said polypeptide is comprised of a nuclear localization signal (NLS) peptide.

16. A transfection vector wherein said transfection vector is purified and comprises a synthetic polypeptide linked electrostatically to a DNA structural sequence, forming a polypeptide-DNA complex, wherein said polypeptide is comprised of a nuclear localization signal (NLS) peptide.

17. A transfection vector in a kit wherein said transfection vector comprises a synthetic polypeptide linked electrostatically to a DNA structural sequence, forming a polypeptide-DNA complex, wherein said polypeptide is comprised of a nuclear localization signal (NLS) peptide.

18. A transfection vector outside a cell wherein said transfection vector comprises a synthetic polypeptide linked electrostatically to a DNA structural sequence, forming a polypeptide-DNA complex, wherein said polypeptide is comprised of a nuclear localization signal (NLS) peptide.

19. A process for producing a transformed mammalian cell line, comprising the step of transfecting a mammalian cell with a vector according to any of Claims 15-18.

20. A process for producing a transfected eukaryotic cell comprising the step of transfecting a eukaryotic cell with a vector according to any of Claims 15-18.